

THEREFORE, WE CLAIM:

1. A coating comprising:
a film-forming resin; and
5 a plurality of particles having an average particle size between 0.1 and 15 microns dispersed in said resin, wherein the particles have a hardness sufficient to impart greater mar and/or scratch resistance as compared to no particle being present.
- 10 2. The coating of Claim 1, wherein said particles are organic particles.
3. The coating of Claim 2, wherein said organic particles are diamond particles.
- 15 4. The coating of Claim 2, wherein said organic particles are carbide particles selected from titanium carbide and boron carbide.
5. The coating of Claim 2, wherein said organic particles are silicon
20 carbide particles having a median particle size of less than 3 microns.
6. The coating of Claim 1, wherein said particles are inorganic.
7. The coating composition of Claim 6, wherein said inorganic
25 particles are selected from silica, alkali alumina silicate, borosilicate glass, nitrides, oxides, quartz, nepheline syenite, zircon, buddeluyite, and eudialyte.
8. The coating of Claim 7, wherein said silica is crystalline silica,
amorphous silica, precipitated silica or mixtures thereof.

9. The coating of Claim 7, wherein said nitride is boron nitride, silicon nitride, or mixtures thereof.

10. The coating of Claim 6, wherein said inorganic particles are uncalcined alumina.

11. The coating of Claim 6, wherein said inorganic particles are calcined unground alumina having a median crystallite size less than 5.5 microns.

12. The coating of Claim 6, wherein said organic particles are calcined ground alumina having a median particle size of less than 3 microns.

13. The coating of Claim 1, wherein said plurality of particles is a mixture of particles.

14. The coating of Claim 1, wherein said coating is a powder coating.

15. The coating of Claim 1, wherein the film-forming resin comprises at least one reactive functional group containing polymer and at least one curing agent having functional groups reactive with the functional group of the polymer.

16. The coating of Claim 15, wherein the polymer is selected from acrylic polymers, polyester polymers, polyurethane polymers, and polyether polymers.

17. The coating composition of Claim 16, wherein the polymer comprises reactive functional groups selected from epoxy groups, carboxylic

105021 64423001

acid groups, hydroxyl groups, isocyanate groups, amide groups, carbamate groups, carboxylate groups and mixtures thereof.

- 5 18. The coating of Claim 1, wherein the coating is liquid.
19. The coating of Claim 1, wherein the average particle size ranges between 1 and 10 microns.
- 10 20. The coating of Claim 19, wherein the average particle size ranges between 3 and 6 microns.
21. The coating of Claim 1, wherein the average particle size is less than 3 microns.
- 15 22. The coating of Claim 1, wherein the average Mohs hardness of the particles is 4.5 or greater.
23. The coating of Claim 22, wherein the average Mohs hardness is 5 or greater.
- 20 24. The coating of Claim 23, wherein the average Mohs hardness is 8 or greater.
25. The coating of Claim 1, wherein the average Mohs hardness is 25 between 4.5 and 7.5.
26. The coating of Claim 1, wherein said particles are spherical.
27. The coating of Claim 1, wherein said particles are nonuniform.
- 30

28. The coating of Claim 1, wherein said particles are platy.

29. The coating of Claim 1, wherein said particles are calcined.

5 30. The coating of Claim 1, wherein the weight percent of the particles is between 0.1 and 20.

31. The coating of Claim 30, wherein the weight percent is between 0.1 and 10.

10 32. The coating of Claim 30, wherein the weight percent is between 0.1 and 8.

15 33. The coating of Claim 1, wherein the weight percent is greater than 5.

34. A substrate coated with the coating of Claim 1.

35. The substrate of Claim 34, wherein said substrate is metallic.

20 36. The substrate of Claim 34, wherein said substrate is polymeric.

37. The substrate of Claim 34, wherein one or more additional layers are disposed between the substrate and the coating.

25 38. The substrate of Claim 34, wherein the coating is between 0.1 and 10 mils thick.

105021 6114001

39. A method for improving the scratch and/or mar resistance of a substrate comprising applying to at least a portion of the substrate the coating of Claim 1.

5 40. The method of Claim 39, wherein an intervening layer is applied to the substrate prior to application of the coating.

10 41. A method for preparing a powder coating comprising the step of extruding together a film-forming resin and a plurality of particles, wherein the particles have a hardness sufficient to impart greater mar and/or scratch resistance to the coating as compared to no particle being present.

15 42. A cured powder coating having a plurality of particles dispersed therein, which undergoes less than 10 percent gloss reduction after 500 hours of QUV exposure.

 43. The coating of Claim 42 having less than 5 percent gloss reduction after 500 hours of QUV exposure.

20 44. The coating of Claim 42, wherein the gloss reduction improves after QUV exposure.

 45. The coating of Claim 1, wherein said particles are heat treated prior to being dispersed in said resin.

25 46. The coating of Claim 1, wherein the coating, when cured and subjected to mar and/or scratch testing, has a greater 20° gloss retention as compared to no particle being present.

4003-143-3054
"OFFICE"

47. The coating of Claim 46, wherein the 20° gloss retention after mar and/or scratch testing is 20 percent or greater.

48. The coating of Claim 46, wherein the 20° gloss retention after mar
5 and/or scratch testing is 50 percent or greater.

49. The coating of Claim 46, wherein the 20° gloss retention after mar and/or scratch testing is 70 percent or greater.

10 50. The coating of Claim 1, wherein the average particle size is less than 10 microns.

FOOTNOTES